SOCIETY NEWS



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GRANITES II: A SUMMER SCHOOL ON MAGMATIC DIFFERENTIATION

On the sunny pink granite coast of Roscoff (Brittany, France), 78 attendees gathered from all over the world (Armenia, Austria, Canada, China, France, Germany, Hungary, Italy, Portugal, Spain, Swiss, UK and USA) to debate for 5 days (8 to 12 July 2019) the origin of the chemical diversity of magmatic rocks. The burning question was, "What drives the variety of chemical compositions of both volcanic and plutonic rocks?" The main sponsors of this extended summer school, entitled GRANITES II: Magmatic Differentiation (https://granites.sciencesconf. org/), were the CNRS and the VOLTAIRE Labex project coordinated by Bruno Scaillet (Orléans, France).

The Granites II summer school is the second in a series that started in 2017 at Orléans and was led by two researchers from the Institut des Sciences de la Terre d'Orléans (France), Laurent Arbaret and Fabrice Gaillard. For this second edition, Erwan Hallot (University of Rennes I, France) joined the organizing committee and led a field excursion across the famous Ploumanac'h composite granite intrusion of north Brittany, where well-exposed outcrops reveal world-class mingling textures that suggest different degrees of magma differentiation.

Over the five days, prestigious speakers discussed aspects of their own research and added some historical perspectives to a scientific debate that started over 200 years ago and is still not resolved. Thus, Olivier Bachman, Georges Bergantz, Jon Blundy, Wendy Bohrson, John Clemens, Fidel Costa, Marian Holness, Wolfgang Maier, Jean-François Moyen, Othmar Müntener, and Michel Pichavant all shared their knowledge with early carrier researchers (PhD students and postdoc fellows). During the evenings, and after each day's course, there were vibrant question times which revealed the incredible scientific maturity of the "future Bowen generation".

The petrological nature of trans-crustal arcs were discussed, the puzzling rarity of cumulative rocks was questioned, the role and amount of water involved in magma genesis/transfer/stopping/eruption was highlighted, the volcanic–plutonic link was challenged, the different mechanisms of crystal–liquid separation was interrogated and the quantifiable impact of mixing and assimilation was addressed. Following the philosophy

of the GRANITES II summer school, the talks were given by specialists in volcanic and in plutonic systems. This diverse approach meant that the early carrier scientists experienced the striking divergences that different researchers take in how to interpret the chemical diversity of magmas. It was agreed that a combination of crystal–liquid fractionation from mafic mantle-derived melts and partial melting of crustal lithologies could account for the chemical diversity of magmas.

Critical challenges for this next "Bowen generation" were identified during a session led by Liz Cottrell (Smithsonian National Museum of Natural History, Washington DC, USA). Liz pinpointed key questions to be addressed regarding the dynamics of solid–liquid separation in magmatic mushes; the timescales of melt extraction, transport and crystallisation; how to constrain sampling bias at all scales; the need to increase fundamental data for phase equilibrium databases, including amphibole, and studying new lower- and mid-crustal sections; and addressing the extent of disequilibrium processes in crystal–liquid reactions and their impact on differentiation paths.

> **Laurent Arbaret** and **Fabrice Gaillard** Institut des Sciences de la Terre, Orléans (France)

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Congratulations to post-doctoral researcher Céline Baudoin and PhD students Axel Denys, Clément Laskar and Marion Turuani for each winning a grant from the SFMC to present their research work at the 2019 Goldschmidt Conference in Barcelona (Spain) last August.



Axel Denys (left) and Céline Baudoin (right)



Marion Turuani (left) and Clément Laskar (right)